Trend Study 28-10-98

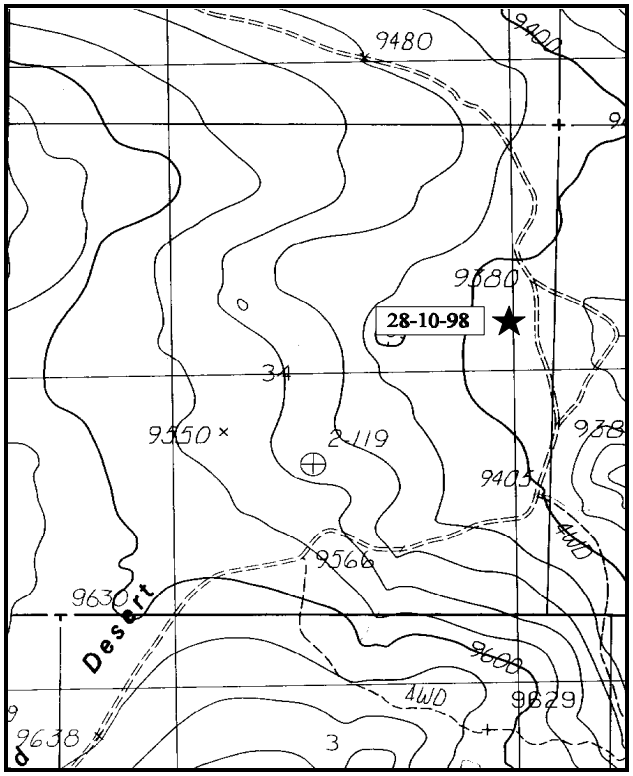
Study site name: Red Desert . Range type: Quaking Aspen .

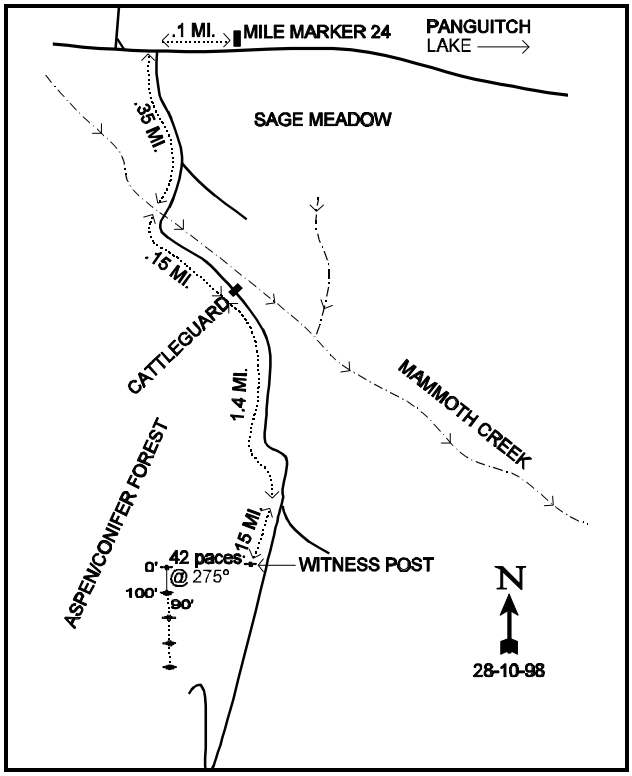
Compass bearing: frequency baseline 182 degrees.

Footmark (first frame at) 5 feet, footmarks (frequency belts) line 1 (11 & 71ft), line 2 (34ft), line 3 (59ft), line 4 (95ft).

LOCATION DESCRIPTION

From Panguitch Lake, travel southwest on the highway to mile marker 24 and continue 0.1 mile. Turn left (south) onto a dirt road. Proceed 0.25 miles to a fork, bear right. Go 0.1 mile to Mammoth Creek. Cross and continue for 0.15 miles to a cattleguard. Continue 1.4 miles to a fork, bear right. Proceed south 0.15 miles to the study area. There is a witness post (a 2-foot tall fencepost) on the right side of the road. The transect starts off in the forest, 242 feet (42 paces) southwest (275°) of the witness post. The 0-foot baseline stake, another 2-foot fencepost, is marked by a browse tag #9007. The study runs south from here (180°).





Map Name: Panguitch Lake Diagrammatic Sketch

Township 36S , Range 8W , Section 34 UTM 4167159.509 N, 348000.173 E

DISCUSSION

Trend Study No. 28-10 (47-10)

The Red Desert trend study is in the Mammoth Creek drainage on top of the Markagunt Plateau. Elevation is 9,400 feet and the area provides summer range for deer and elk. The site is almost level with a slightly east aspect. The range type consists of aspen with increasing numbers of subalpine fir and spruce as succession progresses toward a climax coniferous forest. Wildlife use is light to moderate and is likely exclusively summer use. In 1998, a pellet group transect parallel to the baseline indicated 25 deer days use/acre, 9 elk days use/acre, 7 sheep days use/acre, and 2 cow days use/acre. Thinning of some of the competing trees appears to have taken place within the past 10 years. In 1992, it appeared that some logging may take place as many of the trees were marked with blue spray paint. In 1998, it was apparent that logging did not occur in the study area.

The dark brown loam soil is moderately deep with an average effective rooting depth (see methods) of almost 16 inches. Soil textural analysis indicates a clay loam with a slightly acidic pH (6.1). There are some exposed rocky, bare areas but overall vegetative cover is good, especially in the openings where grasses and small forbs predominate. Erosion is minimal over all years.

The overstory of this open forest is mainly mature aspen trees. Most of the mature aspen are unavailable, as the trees average 80 feet in height. An uneven mix of age classes are present, from large decadent trees to clumps of young and scattered sprouts and seedlings. The density plot data from 1987 show that 15% of the population were mature trees (233 per acre). The 72% classified as decadent were all young sprouts about three feet tall, but the tops were dead due to a combination of competition, hedging, and insect damage. However, the plants were still alive as evidenced by sprouting from the base; and this is the growth that was measured. A few vigorous, unutilized young plants were found. Seedlings or small sprouts were common on two of the density plots. During the 1992 reading, aspen density was estimated at 1,320 plants/acre with a much larger sampling design. Percent decadency declined to 18% and biotic and reproductive potentials increased. Utilization was slightly heavier with 21% of the aspen displaying heavy hedging compared to 15% in 1987. In 1998, the estimated density was 1,020 plants/acre, most of which were classified as young plants. Many seedlings were also encountered (1,160 plants/acre). Percent decadency has declined and utilization is now mostly light. Line intercept data from 1998 indicated 11% canopy cover for aspen.

In 1987, it appeared that aspen were losing out to the subalpine fir. There were an estimated 1,599 subalpine fir trees per acre, 83% of which were classified as young. Seedling trees numbered 366 trees/acre. In 1992 and 1998, there were an estimated 1,040 subalpine fir. Age structure shows that the subalpine fir community is still comprised of mostly young trees. Engelmann spruce density is estimated to be 520 plants/acre in 1998, a great deal short of the 2,860 plants/acre estimated in 1992. As with the subalpine fir community, most of the Engelmann spruce trees were classified as young. It appears that these populations will increase due to the abundant numbers of seedling and young trees. Line intercept data from 1998 indicates 11% cover for Engelmann spruce and 13% cover for subalpine fir.

The open aspect of the understory provides a good site for herbaceous vegetation. Six species of rather short, tufted grasses and one sedge were encountered in 1987, nine during the 1992 reading, and eight in 1998. The sedge continues to be the most common species but has significantly declined since 1987. Other common species include mountain muhly and muttongrass. Forbs are also common but most are low-growing and unutilized. Weedy milkvetch, lobeleaf groundsel, pussytoes, and spring parsley are the most abundant species. Perennial herbaceous understory sum of nested frequency has declined from 1,226 in 1992 to 995 in 1998.

1987 APPARENT TREND ASSESSMENT

Ground cover is generally excellent due to the quantity of herbaceous vegetation which provides good ground cover in the openings. There is a buildup of litter, which constitutes 83% of the ground cover. Bare soil has a value of 8%. Aspen appears to be losing out to subalpine fir and spruce. The herbaceous understory is diverse and abundant, but grasses and forbs are low growing and provide limited forage.

1992 TREND ASSESSMENT

Soil erosion is not a problem on this site due to the lack of slope and the abundant vegetation and litter cover. With the new larger sample size, more bare ground and less litter were estimated, but the soil trend is still stable. Aspen, the key browse species, has increased slightly in density and has good biotic and reproductive potentials. Percent decadence has decreased significantly while utilization is slightly higher. The trend is stable to slightly up for the moment, but the trend will decline with the fir and spruce trees becoming larger. Continued logging would improve the forage production of this site. Sum of nested frequencies for grasses have declined slightly while forb frequencies have increased. Forbs make up 66% of the herbaceous understory cover. Trend for herbaceous understory is up slightly.

TREND ASSESSMENT
soil - stable
browse - stable to slightly up
herbaceous understory - slightly up

1998 TREND ASSESSMENT

The soil trend is stable with no current erosion apparent on the site. Percent vegetation and litter cover are high enough to keep accelerated erosion from occurring. The browse trend is stable. The densities for aspen, subalpine fir and Engelmann spruce appear to be stable at this time. There are many young and seedling plants in the populations which would indicate increases in density in the future. As the fir and spruce continue to increase in density, the aspen will decrease. The herbaceous understory trend is slightly downward with a decrease in perennial herbaceous understory sum of nested frequency.

TREND ASSESSMENT
soil - stable
browse - stable
herbaceous understory - slightly downward

HERBACEOUS TRENDS --
Herd unit 28 , Study no: 10

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'92	'98	'87	'92	'98	'92	'98
G	Bromus ciliatus	44	38	25	17	16	11	.35	1.76
G	Carex spp.	$_{b}$151	$_{b}$142	$_{a}$104	66	65	48	1.91	1.87
G	Festuca ovina	$_{b}$81	$_{a}$44	$_{a}$28	31	22	12	.26	.18
G	Muhlenbergia montana	99	75	79	41	31	33	1.49	1.67
G	Poa fendleriana	$_{b}$57	$_{ab}$50	$_{a}$31	31	26	16	.51	.81
G	Poa pratensis	$_{a}$-	$_{b}$30	$_{b}$28	-	11	10	.78	.46
G	Sitanion hystrix	56	53	44	27	22	19	.84	.62

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'92	'98	'87	'92	'98	'92	'98
G	Stipa comata	-	1	4	-	1	2	.00	.16
G	Stipa lettermani	$_{ab}$2	$_{b}$7	$_{a}$-	1	3	-	.16	.00
Total Annual Grasses		0	0	0	0	0	0	0	0
Total Perennial Grasses		490	440	343	214	197	151	6.32	7.56
F	Achillea millefolium	$_{a}$12	$_{b}$36	$_{b}$36	5	14	14	.58	.81
F	Agoseris glauca	-	14	11	-	5	6	.19	.08
F	Antennaria rosea	109	113	105	40	39	41	2.55	4.18
F	Androsace septentrionalis (a)	-	20	24	-	9	10	.04	.10
F	Arabis spp.	-	3	-	-	2	-	.01	-
F	Astragalus miser	$_{a}$39	$_{b}$142	$_{a}$85	20	58	41	4.95	1.93
F	Aster spp.	-	1	1	-	1	1	.03	.03
F	Cirsium foliosum	35	28	23	16	13	10	.28	.74
F	Cruciferae	$_{b}$17	$_{b}$23	$_{a}$3	9	10	1	.12	.00
F	Erigeron spp.	$_{b}$13	$_{a}$-	$_{a}$-	6	-	-	-	-
F	Frasera speciosa	-	1	-	-	1	-	.00	-
F	Fragaria virginiana	31	33	24	12	14	10	.78	1.61
F	Gentianella heterosepala	$_{a}$45	$_{a}$31	$_{b}$70	19	15	34	.39	.57
F	Lomatium spp.	54	78	65	21	33	29	1.04	1.06
F	Lychnis drummondii	$_{a}$-	$_{b}$25	$_{b}$18	-	12	8	.06	.06
F	Penstemon leiophyllus	22	22	7	11	10	4	.10	.02
F	Potentilla gracilis	24	6	12	10	4	6	.04	.08
F	Senecio multilobatus	$_{c}$156	$_{b}$121	$_{a}$86	60	51	38	.60	1.06
F	Senecio spp.	$_{a}$-	$_{b}$7	$_{a}$-	-	4	-	.09	-
F	Smilacina racemosa amplexicaulis	2	-	-	1	-	-	-	-
F	Taraxacum officinale	$_{b}$60	$_{ab}$41	$_{a}$35	34	23	19	.49	.27
F	Tragopogon dubius	$_{b}$20	$_{a}$5	$_{a}$-	9	3	-	.04	-
F	Trifolium longipes	$_{a}$60	$_{ab}$56	$_{b}$71	19	22	25	.82	2.16
Total Annual Forbs		0	20	24	0	9	10	0.04	0.10
Total Perennial Forbs		699	806	676	292	343	297	13.27	14.81

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 28 , Study no: 10

Type	Species	Strip Frequency '92	'98	Average Cover % '92	'98
B	Abies lasiocarpa	17	20	11.45	7.39
B	Juniperus communis	3	0	.95	-
B	Picea engelmannii	20	13	8.56	7.48
B	Populus tremuloides	30	26	10.86	2.15
Total for Browse		70	59	31.83	17.03

CANOPY COVER --
Herd unit 28 , Study no: 10

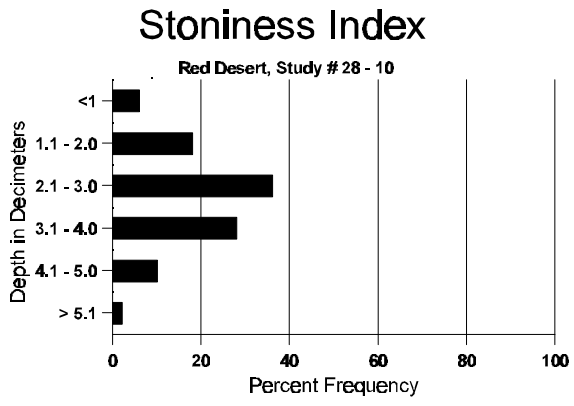
Species	Percent Cover '98
Abies lasiocarpa	13
Populus tremuloides	11
Pseudotsuga menziesii	11

BASIC COVER --
Herd unit 28 , Study no: 10

Cover Type	Nested Frequency '92	'98	Average Cover % '87	'92	'98
Vegetation	295	292	6.25	47.14	45.03
Rock	24	42	2.00	1.68	1.36
Pavement	-	38	0	0	.69
Litter	248	395	83.25	74.00	80.59
Cryptogams	33	46	1.00	2.88	.57
Bare Ground	51	96	7.50	5.78	5.45

SOIL ANALYSIS DATA --
Herd Unit 28, Study # 10, Study Name: Red Desert

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
15.8	39.4 (16.7)	6.1	38.7	29.4	21.8	3.2	27.6	118.4	.3



PELLET GROUP FREQUENCY --
Herd unit 28 , Study no: 10

Type	Quadrat Frequency '92	'98
Sheep	2	-
Elk	-	2
Deer	5	5

BROWSE CHARACTERISTICS --
Herd unit 28 , Study no: 10

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Abies lasiocarpa																		
S	87	11	-	-	-	-	-	-	-	-	11	-	-	-	366			11
	92	21	3	-	3	-	-	4	-	-	31	-	-	-	620			31
	98	8	-	-	2	-	-	-	-	-	10	-	-	-	200			10
Y	87	40	-	-	-	-	-	-	-	-	40	-	-	-	1333			40
	92	24	2	-	5	6	-	1	-	-	37	-	-	-	760			38
	98	10	-	-	23	-	-	-	-	-	33	-	-	-	660			33
M	87	7	-	1	-	-	-	-	-	-	8	-	-	-	266			8
	92	2	-	-	-	-	-	2	8	-	12	-	-	-	240			12
	98	8	-	-	-	-	-	-	11	-	19	-	-	-	380			19
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	1	-	-	1	-	-	2	-	-	-	40			2
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	120			6

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	02%	00%	-35%
'92	15%	00%	00%	+ 0%
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	1599	Dec:	0%
	'92	1040		4%
	'98	1040		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus communis																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	92	3	-	-	-	-	-	-	-	-	3	-	-	-	60	-	-	3
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'92	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'87	0		-
	'92	80		-
	'98	0		-

Picea engelmannii																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	2	-	-	1	-	-	-	-	-	3	-	-	-	60			3
	98	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	21	3	-	1	-	-	-	-	-	25	-	-	-	2720			136
	98	16	-	-	-	-	-	-	1	-	17	-	-	-	340			17
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	92	1	-	-	1	-	-	2	3	-	7	-	-	-	140	-	-	7
	98	4	-	-	-	-	-	-	5	-	5	-	-	-	180	-	-	9
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'92	02%	00%	00%	-82%
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'87	0		-
	'92	2860		-
	'98	520		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Populus tremuloides																		
S	87	7	3	3	-	-	-	-	-	-	11	-	2	-	433			13
	92	56	15	5	-	-	-	-	-	-	76	-	-	-	1520			76
	98	58	-	-	-	-	-	-	-	-	58	-	-	-	1160			58
Y	87	1	-	-	1	-	-	-	-	-	2	-	-	-	66			2
	92	1	30	9	-	-	-	2	2	-	44	-	-	-	880			44
	98	32	4	1	-	-	-	-	-	-	37	-	-	-	760			38
M	87	-	-	-	-	-	-	-	4	3	7	-	-	-	233	393	74	7
	92	-	-	3	-	-	-	-	7	-	10	-	-	-	200	-	-	10
	98	1	-	-	-	-	-	-	12	-	13	-	-	-	260	-	-	13
D	87	7	15	2	-	-	-	-	-	-	22	-	2	-	800			24
	92	1	9	2	-	-	-	-	-	-	10	-	1	1	240			12
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	92	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	45%	15%	06%	+17%
'92	59%	21%	03%	-23%
'98	08%	02%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	1099	Dec:		73%
'92	1320			18%
'98	1020			0%